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TECHNOLOGY DEPT.

SCIENCE NEWS LETTER

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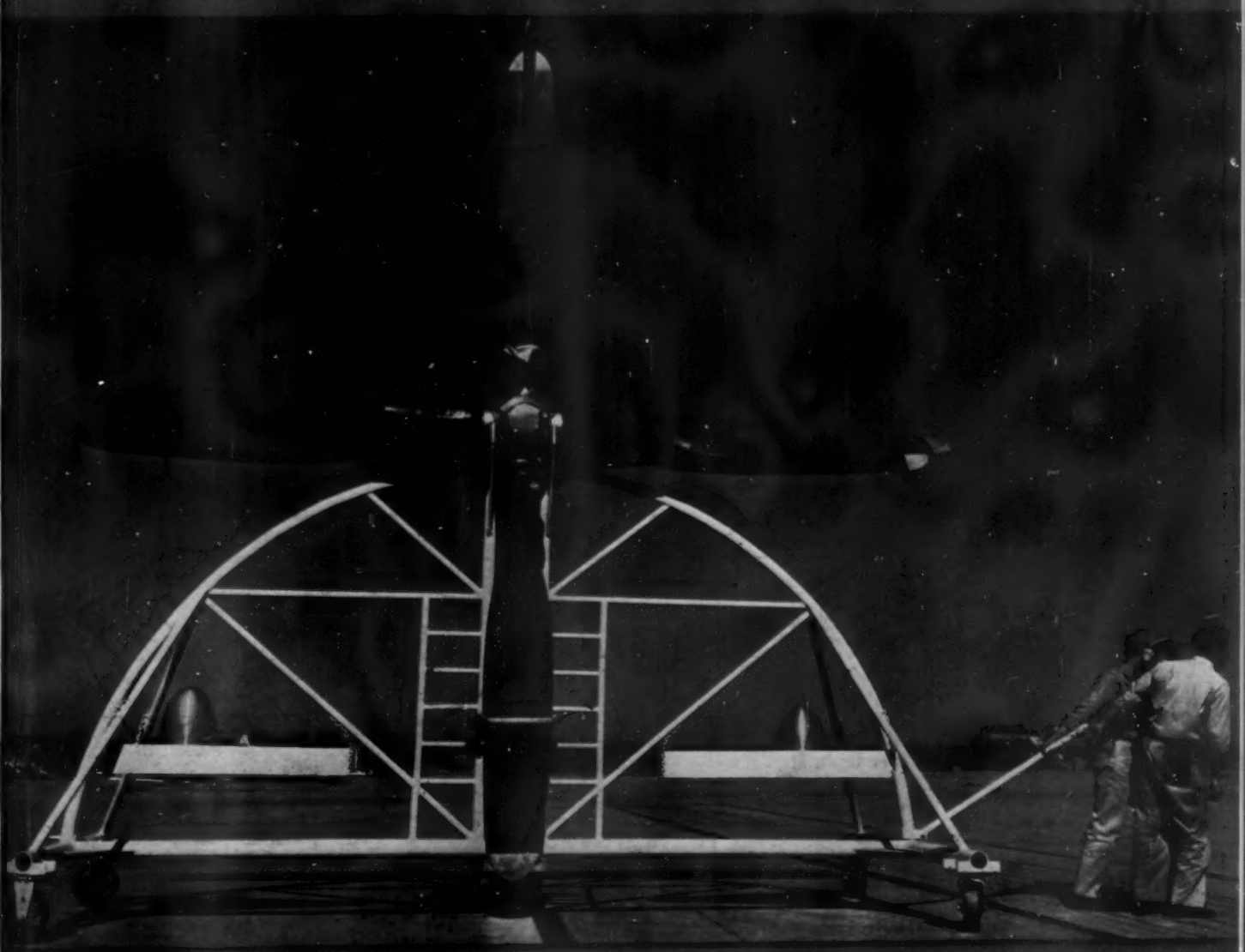
THE WEEKLY SUMMARY OF CURRENT SCIENCE • OCTOBER 20, 1945



Reversible Pitch

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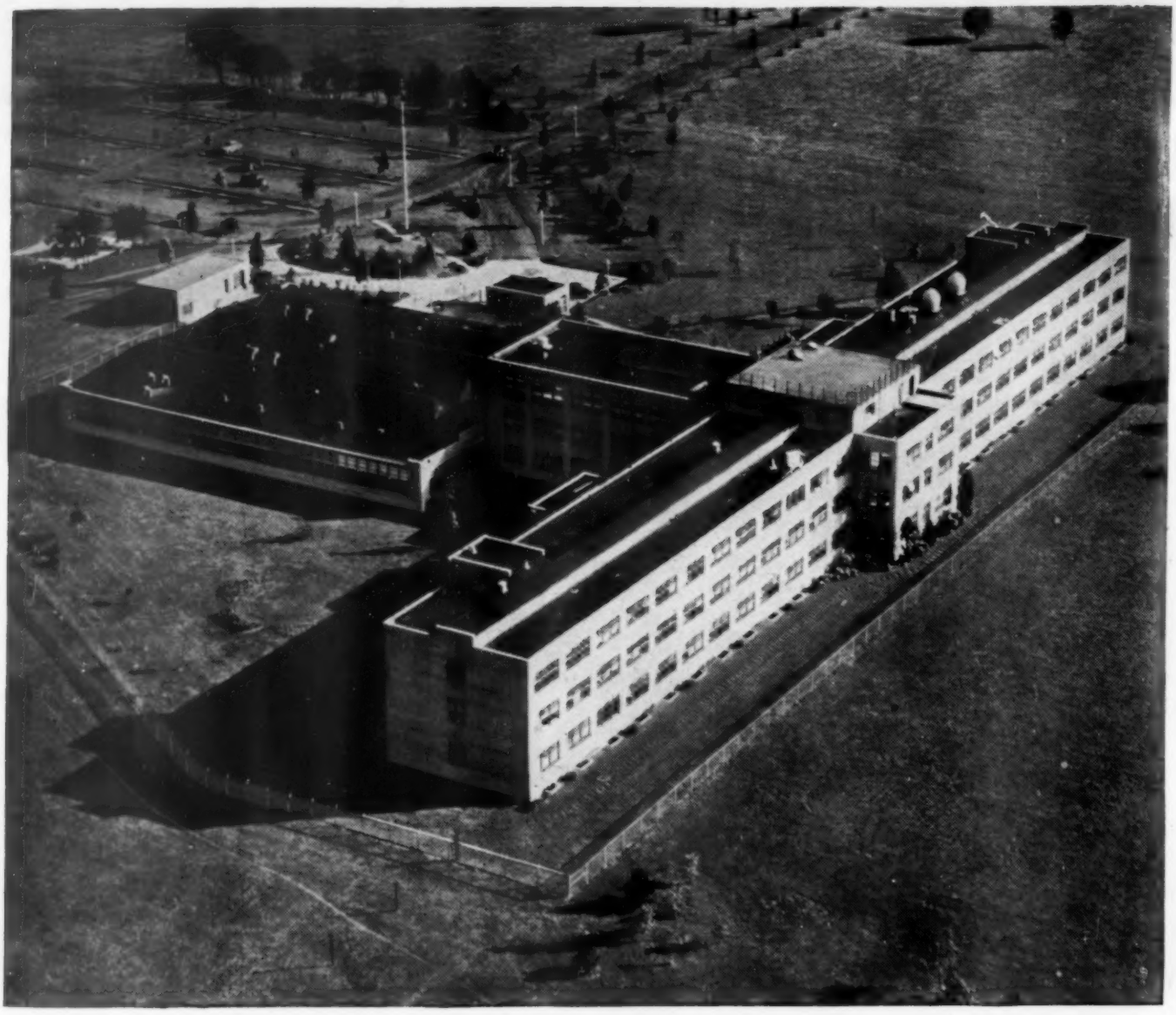
A SCIENCE SERVICE PUBLICATION



RCA Laboratories—Center of Radio and Electronic Research

RCA Laboratories at Princeton, N. J., are far more than one of the most modern and best-equipped laboratories ever built. It is a community of scientists, research men and technicians—each a top man in his field—each working with the other—contributing wherever and whenever his specialized knowledge will help.

It is a "university of ideas"—where visions are graduated as practical realities . . . where human wants are fulfilled through the creation of new products and processes, new services and markets.

It is a birthplace of scientific, industrial and social progress for the entire nation.

It is the reason why anything bearing the letters "RCA"—from a radio tube to your television receiver of tomorrow—is one of the finest instruments of its kind that science has yet achieved.

For just as the RCA electron tube, television receiver, radio, or the Victrola, is stamped by the RCA trademark, so does the product itself bear a stamp of experience and research that gives RCA pre-eminence in the field of radio and electronics.

Radio Corporation of America, RCA Building, Radio City, New York 20. *Listen to The RCA Show, Sundays, 4:30 P.M., Eastern Time, over the NBC network.*

PIONEERING

Scientists and research men who work in RCA Laboratories made many vital contributions in helping to win the war through application of radio, electronic, radar and television techniques. Their skills now are devoted to peacetime applications of these sciences.

At RCA Laboratories the electron microscope, radar, all-electronic television (featuring the projection system for the home) and many other new instruments of radio, including hundreds of new electron tubes, were developed to improve and to extend the services of radio around the world.

RADIO CORPORATION of AMERICA

GENERAL SCIENCE

Back to College

Grants of $2,500,000 to speed return of war scientists to college research and teaching. Program of Research Corporation to cover five years.

➤ SCIENTISTS who have been doing war research on atomic bombs, radar, jet propulsion, and many other weapons will have the chance to get back promptly to peacetime research and teaching in colleges and universities through $2,500,000 in grants offered by the non-profit Research Corporation of New York, which develops inventions assigned to it by public-spirited inventors.

The five-year program was announced by Dr. Joseph W. Barker, acting president, who has returned to his duties with the Corporation and with Columbia University from service as Special Assistant to the Secretary of the Navy.

It will result in 100 to 200 grants of $2,500 to $5,000 each year in order that talented young scientists, engaged for the most part in war research in uniform or as civilians, will be able to undertake at universities and colleges research of peacetime importance in pure science, especially chemistry, physics, mathematics and engineering.

The first grants will be made in a few weeks by a special committee of eminent scientists from industrial and university laboratories. The committee is composed of Acting President Barker who is also Dean of Engineering at Columbia University; Dr. Thomas H. Chilton, director of engineering for duPont; Dr. William D. Coolidge, X-ray consultant for General Electric Co.; Timothy E. Shea, manufacturing engineer of Western Electric Co.; Dr. Lloyd P. Smith, associate research director of Radio Corporation of America; Col. Stafford L. Warren, professor of medicine at the University of Rochester; and Dr. Robert R. Williams, inventor of the synthesis of vitamin B_1 and coordinator of research of Research Corporation.

Grants will be made to the institutions, but awards will be based primarily upon the demonstrated ability of the men who will conduct the researches and contribute to the teaching program of the school.

"For the past four or five years," said Dr. Barker, "the Government, through the Office of Scientific Research and Development, the National Defense Research Council, the Army, the Navy, and the Air Force, has supported a vast research and development program into which has been drawn the great majority of the most competent university research men. Already the demobilization of these research projects is under way. When their war jobs are finished many of these talented young scientists should be going back to college laboratories and lecture rooms to train and inspire the next generation of science.

"War conditions have greatly disturbed our educational institutions by diversion of talented members of their faculties into war research, by drawing off faculty and students into military service, by utilizing educational facilities for military service training programs and by interrupting sources of financial support.

"Research budgets have been drastically curtailed, especially in the smaller institutions, which in many cases have not had opportunity to undertake Government research on a substantial scale. The financial strength of many institutions also has been impaired by the depression and the war conditions which followed. Now new burdens are thrust upon them as young men from the services return to resume their interrupted training.

"Research Corporation's program of special postwar grants will round out the plans that are being made for the most effective and most prompt return of the war-engaged scientists to peacetime fundamental and applied research," Dr. Barker explained. "The Rockefeller foundation has already announced a comprehensive plan of pre-doctoral fellowships which will return to college former graduate students who left their studies and researches for war research. Current government legislation and proposed bills being considered by Congress will aid the return to college of students whose scientific and technological education was interrupted by the war. Research Corporation grants will assist colleges and universities in building research-minded staffs which will help train the students returning to colleges from the war, as well as the future contingents of students from our secondary schools in future years."

B-29'S SUCCESS—In the new Bendix-Stromberg direct fuel injection system, which equipped the Superforts that dropped the atom bombs, the fuel is pumped under pressure directly into individual engine cylinders, entering via the stainless steel fuel lines and the nozzle shown at the upper left. Spark plug is at right. The technician's hand holds the fuel spray nozzle at the point where gasoline is sprayed into the cylinder.

The grants are made possible by the fact that during the war years research programs that would be normally supported by Research Corporation grants have been laid aside in order to free men and facilities for war research.

Research Corporation was begun in 1912 with the gift, through Dr. F. G. Cottrell, of patent rights on electrical precipitation, which is used for removing dust, fume and mists from industrial gases and from the atmosphere.

Science News Letter, October 20, 1945

GENERAL SCIENCE

AAAS to Hold Meeting In St. Louis in March

➤ AMERICAN scientists will get together for their first big general postwar meeting in St. Louis, on March 27 to 30, 1946, Dr. F. R. Moulton, permanent secretary of the American Association for the Advancement of Science, announced. A tremendous volume of scientific information, dammed up by war-imposed necessity for secrecy as well as by lack of opportunity to report either in print

or by word of mouth, is expected to be released at this four-day gathering.

The American Association for the Advancement of Science is the great general society to which most American scientists belong. Total membership exceeds 27,000, and its meetings, which are held jointly with those of many of the 190 specialized scientific societies and groups affiliated with it, usually attract crowds of from 3,000 to 5,000 research men and teachers.

In normal times, the Association has held its meetings twice a year, one during the Christmas holidays and one in early summer. However, like all large societies, the Association has kept meetings rather strictly in abeyance during the war. A meeting was held in Dallas, Texas, during the Christmas week immediately after Pearl Harbor, because it had already been scheduled. It was deemed advisable to hold another meeting in Cleveland in the fall of 1944, but that was the only strictly wartime gathering of the Association's members. With war restrictions on travel now removed, a heavy attendance at St. Louis next spring is expected.

Science News Letter, October 20, 1945

PHYSIOLOGY

Bone Twists Affect Gait

The characteristic way in which a person walks is determined during the period when he learns to walk. Knowledge is useful in correcting bad foot posture.

➤ CERTAIN twists in the leg bones, developed during the years when children are learning to walk, largely determine the gait or characteristic way in which a person walks, it appears from studies reported by Dr. Herbert Elftman of Columbia University in the *American Journal of Physical Anthropology*, (Oct.).

The bones making up the upper and lower parts of your leg develop their twists independently. If you "toe in," the combination of these twists are in one direction; whereas, if you "toe out," the twists are in the opposite direction. Scientists, especially orthopedists, are interested in learning how each leg bone affects walking, because this knowledge is useful in correcting bad foot posture.

It is almost impossible to measure the twist in a leg bone during life, even with the X-ray. Dried bones are not entirely satisfactory either, because it is impossible to tell at what angles they were connected with one another. For example, if you straighten your leg and try toeing in and out, you will notice that the whole leg from the hip downwards turns with the foot. Thus it is necessary to study the leg as a whole. To solve this problem Dr. Elftman resorted to studying legs that have been taken off at the hip. All that he needed to do in such cases was to expose enough of the joints at the hip, knee and ankle to determine their axes. From the angles which these joints make with a standard plane he could determine the amount of twisting in each bone.

From Dr. Elftman's findings, there appears to be little relationship between the twist in the thigh bone and that in the lower leg bones. On the other hand, the twisting of the lower leg bones as seen in the ankle joint has a definite relationship to foot position. Dr. Elftman points out also that the twists in the adult bones are quite different in degree from those present at birth. Although the evidence is incomplete, it seems to indicate that the adult condition develops during the years when children learn to walk.

Science News Letter, October 20, 1945

ELECTRONICS

Electronic Device Measures Speed of Baseball

➤ THE SPEED of the baseball between the pitcher's hand and the catcher's mitt needs no longer be a guess; it can be measured, and timed accurately down to a ten-thousandth of a second. Electronics is the answer; a versatile electronic device does the job. The same device can measure the speed of the shutter on a camera or the rate of travel of a bullet from a rifle.

In measuring the speed of a moving body, two photo tubes with light sources aimed on them are set up with a known interval between them and directly in the line of flight of the moving object. The light sources shining on the photo tubes create two beams of light. A meter begins timing when the moving object breaks the first beam of light and ceases timing when it breaks the second. It records the time in thousandths of a second.

In measuring shutter speed on a camera, the time interval meter clocks time consumed by one shutter operation at any speed setting. A photo tube picks up light and transposes it to voltage pulse first when the shutter opens and again when it closes. The dial records the interval. This measurement is taken without any mechanical attachment to the camera which might retard its movement. The device was used during the war to determine time interval in checking high-speed aerial cameras.

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SCIENCE NEWS LETTER
Vol. 48 OCTOBER 20, 1945 No. 16

The weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St. N. W., Washington 6, D. C. NOrth 2255. Edited by WATSON DAVIS.

Subscriptions—$5.00 a year; two years, $8.00; 15 cents a copy. Back numbers more than six months old, if still available, 25 cents. Monthly Overseas Edition: By first class mail to members of the U. S. Armed forces, $1.25 a year. To others outside continental U. S. and Canada by first class mail where letter postage is 3 cents, $1.25; where letter postage is 5 cents $1.50; by airmail, $1.00 plus 12 times the half-ounce airmail rates from U. S. to destination.

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Entered as second class matter at the post office at Washington, D. C., under the Act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

The New York Museum of Science and Industry has elected SCIENCE NEWS LETTER as its official publication to be received by its members.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., PEnnsylvania 6-5566 and 360 N. Michigan Ave., Chicago, STAte 4439.

SCIENCE SERVICE

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MEDICINE

Transplanted Hearts

Have been put in warm-blooded animals with no ill effects. Were planted onto the neck and put "in circuit" with the host's blood circulation system.

➤ SUCCESSFUL transplantation of hearts into warm-blooded animals, such as rabbits, cats and dogs, has been accomplished by Prof. Nikolai Sinitsin of the Gorky Medical Institute, Moscow.

The heart was transplanted onto the host animal's neck and put "in circuit" with the host's blood circulation system. No ill effects were observed. Prof. Sinitsin is now carrying out long-term experiments for the purpose of keeping animals with two hearts alive as long as possible. At the same time he and his associates are conducting experiments for transplanting hearts into the abdomen instead of the neck.

The work is expected to provide a valuable method for studying various problems of heart physiology and treatment of heart disease.

"The transplanted hearts retained their own individual rhythm which as a rule is slower than that of the host's heart," Prof. Sinitsin states in a report written for the Soviet Scientists' Anti-Fascist Committee.

Rabbits, cats and dogs easily withstood the transplantation operation with an "infinitesimal" loss of blood, Prof. Sinitsin reports. There was no visible effect on the work of their own hearts.

The operated animals did not show any shortness of breath, spasms or excessive excitation after the operation. They reacted normally to all external exciters, such as light, sound and pain.

The transplantation of hearts in warm-blooded animals followed earlier work in which Prof. Sinitsin succeeded in transplanting hearts in cold-blooded vertebrates. In these studies, the transplantation consisted in completely replacing a frog's heart with that of another frog. Some of these frogs lived more than six months with a borrowed heart and did not show any differences in behavior from normal frogs. In spring both males and females which had been operated on went through a normal nuptial period which ended with spawning.

"Microscopic examination of the blood vessels that had been sewn together showed that they had knitted completely and that the structure of the heart muscles was normal," Prof. Sinitsin says in describing the results with the frogs.

"When there are two hearts beating in the breast of one frog, they have entirely different relations to the animal's body. The host's own heart has both neural and humoral connections with his body through the blood while for the first 35 to 40 days the transplanted heart has only humoral, chemical connections. The nerves of the host then begin to grow onto the transplanted heart. It is also possible to study the action of a number of heart medicines on the organisms with two hearts.

"There is undoubted interest in the question of the length of time taken by a transplanted heart to take root in the host's organism, when the host's nerves grow onto it and what happens to nerve ganglions inside the heart.

"The success of these experiments on cold-blooded animals led me to repeat the experiments on rabbits, cats and dogs. As a preliminary measure we carefully developed methods of joining blood vessels of warm-blooded animals. The method we developed is exceedingly simple and rapid, taking 20 to 30 seconds to perform.

"For the first series of these experiments we developed methods of transplanting the heart onto necks of these animals. In this series of experiments the second heart had only its right half joined into the host's blood circulatory system. The left half of the heart was not 'in circuit'. This system we called the 'semi-clinical' method.

"Observations showed that the heart worked well and would live for a long time. The heart retained its own rhythm and had no adverse effect on the blood pressure of the host or his ability to perform work.

"For the second series of experiments after a long search for the correct method we transplanted hearts onto necks of hosts with both halves arterial and venous in circuit with the blood circulatory system. This gave us a complete second heart 'clinical transplantation' as we called it."

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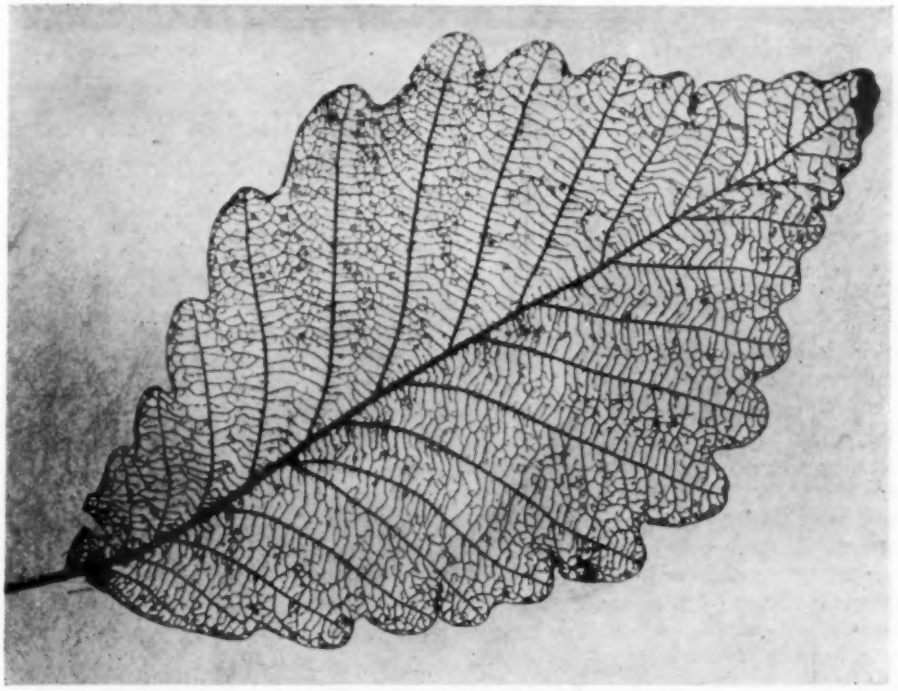

***LEAF SKELETON**—This is the skeleton of a chestnut oak leaf produced by the larval form of a saw-fly. When the larvae hatch out they feed on the pulp of the leaf, leaving the skeleton intact. Three leaves often attacked by this insect include the elm, poplar and chestnut oak. Photograph by George A. Smith, of Quarryville, Pa.*

PHYSICS

Prevent Atom Dangers

World must work out new international cooperation to harness atomic energy to world usefulness and prevent international catastrophe.

By GUDRUN TOKSVIG
Science Service Correspondent

➤ THE FATE of humanity, now that enormous explosive energy has been released from the atom, depends upon the ability of the peoples of the world to cooperate in avoiding common dangers, Dr. Niels Bohr, leading Danish scientist and Nobelist who worked on the American development of the atomic bomb, declared in Copenhagen, Denmark.

"We have left that time far behind us when each man could pick up the nearest stone for self-defense," Dr. Bohr said. "We have also reached that place where the security offered the citizens of a nation by collective defense arrangements is altogether inadequate. Perhaps there is no defense possible against the new powers of destruction, and it depends upon a world-wide cooperation to prevent use of the new sources of energy for purposes which do not serve humanity as a whole. However, the possibility for an international control with this purpose in view may be said to be secured by the gigantic, special character of the efforts, which are unavoidable in manufacturing the new terrible weapon."

"It is evident," Dr. Bohr emphasized, "that no control can be effective without free access to full scientific information and unless opportunity is given to exercise international control in all undertakings which could be catastrophic if not controlled.

"Such safeguards necessitate elimination of all barriers which hitherto have been considered necessary to protect national interests," Dr. Bohr said. "These now are a hindrance for common security against dangers without parallel. It is evident that handling this difficult situation will demand the goodwill of all nations, but it must be understood that we here have to do with something which can become a deathly challenge to civilization itself. A better background to handle such a situation can hardly be found than the serious wish to seek a firm basis for the world's security, which so unanimously has been expressed by all the nations which have been able to defend the elementary human rights through their united efforts. An agreement upon this vital question will create confidence and harmonious relations between nations which can hardly be overestimated.

"In solving this great problem, scientists the world over will be able to offer the most valuable services. The strands which have been woven together through scientific collaboration constitute some of the strongest ties between individuals of different nations, but the entire scientific community will no doubt unite their strongest efforts to make the world clearly realize the values that are at stake, and to appeal to all humanity to listen to the warning that has been given.

"Every man of science who has helped in the work to lay the foundation of the new development is ready to help in every way he sees clear to find a solution of humanity's present crisis, which will be worthy of the ideals for which science has struggled through the ages."

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CHEMISTRY

Chlorine Dioxide Produced In Lab in Small Amounts

➤ CHLORINE DIOXIDE, now an important bleaching and oxidizing agent, can be produced in the laboratory in small quantities by a method that depends upon the reaction of accurately metered dry chlorine with substantially dry powdered sodium chlorite, the American Chemical Society reports in *Industrial and Engineering Chemistry*, (Oct.).

The report is by W. S. Hutchinson and R. I. Derby of General Mills, Inc., Minneapolis, and covers three methods developed by them for producing chlorine dioxide, using these chemicals, for experimental purposes in bleaching flour in their laboratory. The method recommended depends upon the quantity and purity desired.

One method, which can produce up to a tenth of a gram of chlorine dioxide in a one-liter flask, yields chlorine dioxide and chlorine in the effluent gases. For many purposes the excess chlorine is of slight or no consequences when compared to the oxidizing power of the chlorine dioxide produced, they said.

The second method, to produce larger quantities, consists of introducing the chlorine slowly into a mixing chamber and then in a continuous stream of air through a column filled with the dry flaked sodium chlorite. The action is instantaneous.

In the third method, to produce chlorine dioxide in still larger quantities, a generator is used which consists of two or more glass tubes, filled with technical grade sodium chlorite flakes, connected in series with glass tubing. Chlorine and air are introduced at the bottom of the first tube and pass through the others in series. The effluent gases are then conducted to a mixing chamber where they are diluted to any desired concentration with air.

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AERONAUTICS

Planes Can Land Without Touching the Ground

➤ EXCEPT for servicing and overhauling, light planes, using the Army's new portable plane handling system, now need never touch their wheels to the ground for landings and takeoffs.

Known as the Brodie System after its creator, Capt. James H. Brodie, this method permits flight operations in marshes, jungles, mountains and other terrain formerly inaccessible to aircraft unless landing strips were installed. The entire apparatus may be carried in cargo planes, parachuted to earth and set up in less than 24 hours.

A taut steel cable, supported by four 65-foot masts, forms this mid-air "landing strip." Suspended from the cable are three nylon loops, any one of which may be engaged by a landing hook mounted on the upper surface of the plane's wing. The comparatively slow-flying planes "hook" the six-foot loops and slide down the cable until braking power is applied. Takeoffs are accomplished by reversing the process. The planes are raised by derricks and secured to the cable by a releasable stirrup. Under its own power, the plane moves slowly down the cable until flying speed is reached. A lanyard in the cockpit is pulled, releasing the stirrup, and the plane is airborne.

Weighing less than six tons, the rig is considered practical for planes up to 5,000 pounds and with modifications may be used on cargo or landing vessels.

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CHEMISTRY-ENTOMOLOGY

New Mosquito Repellent

NMRI 407, Navy's newest and most potent insecticide, held mosquitoes at bay for over five hours in laboratory tests. Is used like a lotion.

➤ NMRI 407, the Navy's newest and most potent mosquito repellent, is now being tried out under field conditions in Guatemala. In laboratory tests, it held mosquitoes at bay for over five hours. The average time to the first bite was 322 minutes, Lt. Michael Pijoan reported.

Associated with Lt. Pijoan in the mosquito repellent studies at the Naval Medical Research Institute were Lt. (j.g.) L. A. Jachowski, Jr., and Pharmacist's Mates 3rd class H. J. Gerjovich and M. L. Hopwood.

For men working or fighting in the jungle, mosquito repellents are important in spite of the development of the potent insecticide, DDT. The latter brings sure death to many insects, but it kills slowly. A chemical rubbed on the skin which scares the mosquito away before it bites would give good protection against malaria, yellow fever and dengue which are spread by mosquitoes, to say nothing of the comfort in mosquito infested regions.

Because fighting mosquitoes in the jungle is quite a different proposition from protecting yourself from a few bites when you sit outdoors on a summer evening, the Navy's medical scientists developed a "sweat test" for the new repellents. Tropical conditions, with a temperature of 90 degrees Fahrenheit dry bulb, 80 degrees wet bulb, were maintained in the cage full of hundreds of mosquitoes. The scientists and their assistants smeared some repellent on one of their arms and then sat with it inside the cage, holding a clock on the mosquitoes to time the first bite.

To make sure that the repellent would work under conditions of dripping sweat as well as "pool sweat," the kind that stays on the skin instead of dripping off, the testers engaged in vigorous exercise for some of the tests.

During the war dimethyl phthalate was the most commonly used insect repellent, but its repelling time was only 80 or 90 minutes. NMRI 201, announced by the Navy several months ago, had a repelling time of about five hours in the laboratory. When used by several groups in the jungle, this time was about twice as long. Better ones have since been developed, among them 407 and 448.

The latter has a somewhat shorter repellent time than 407, 289 minutes on the average in laboratory trials, but it is much cheaper, costing less than one dollar per pound.

These two chemicals, which even now may only be known by their numbers in the long series tested at the Naval Medical Research Institute, are hydrogenated naphthols. Mixing them with another chemical, 2 phenyl cyclohexanol, prolongs their repelling time.

The repellents were developed in the course of more than two years of work during which many chemicals were screened and the most promising subjected to further study. After the naphthol derivatives were found to be apparently effective, a whole series of them was synthesized and subjected to various chemical manipulations until repellents that "are final and have solved the problem" were developed.

These new repellents are odorless and colorless liquids. They are used like a lotion.

The Department of Agriculture, Pan American Union and Office of Inter-American Affairs have cooperated and assisted in various phases of the work on the new repellents.

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AERONAUTICS

Seamless Enclosure For Airplane Pilot

➤ THANKS to a special electric welding machine developed during the war, pilots and bombardiers on heavy fighting planes were enclosed in seamless plastic domes which gave them an unobstructed view out of the planes. By use of the machine, two large plastic sheets were quickly fused into a single sheet, the Libbey-Owens-Ford Glass Company now reveals.

The machine applies electrical heat to the two edges to be united by means of strip heaters. It controls temperature, timing and pressure automatically, and with the machine the welding of the sheets is put on a mass production basis, replacing former slow hand methods.

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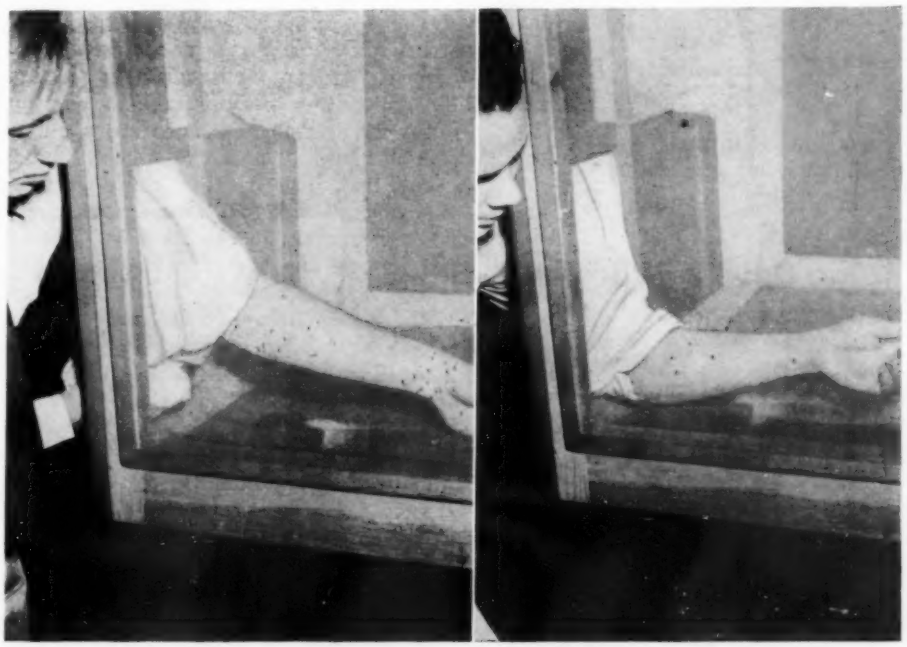
Penned *turkeys* gain weight more rapidly if fed grass clippings.



MOSQUITOES DISAPPEAR—The man's arm on the left has not been protected with the new repellent and the pests cover his arm; on the right, the arm has been covered with NMRI 407.

OCEANOGRAPHY

Mile-Deep Record Sought By Underseas Explorer

➤ EXPLORING the sea bottom one mile straight down, in a massively constructed sphere equipped with wheels, is the ambition of Otis Barton, underseas explorer, now in Bermuda to make preliminary arrangements. He hopes to be able to make his preliminary dives by the summer of 1947.

Record for human descent into the ocean is at present held by Dr. William Beebe of the New York Zoological Society, who in 1934 descended in his bathysphere to a depth of 3,028 feet, or about three-fifths of a mile. The reel which Dr. Beebe used is still in Bermuda, and Mr. Barton is arranging for its use.

There is a difference in purpose between Dr. Beebe's bathysphere and Mr. Barton's apparatus, which he calls a benthoscope. The former was used in studying free-swimming creatures in the water at great depths; the latter is intended for work among the fantastic animals that crawl on the ocean bottom, or are even grown fast to it, like plants. Hence the wheels on Mr. Barton's submarine vehicle. It will not attempt movement under its own power, but will be towed by a cable from a ship.

Mr. Barton had a project for the construction and use of a benthoscope on foot just before the war, and had to suspend action on it until the close of hostilities.

Dr. Beebe, who is also in Bermuda at present, is collecting apparatus which he intends to use in shallow-water undersea exploration off the coast of Venezuela.

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MEDICINE

Large Doses of Vitamin D May Be Harmful

➤ PERSONS who take all types of vitamins indiscriminately and in large amounts are warned by Dr. Jere M. Bauer, of the University of Michigan Hospital, that vitamin D in large doses may be harmful and should be taken only under the direction of a physician.

The first death of an adult as a result of vitamin D intoxication with metastatic calcification, that is, the deposition of calcium in the kidneys, heart, and arteries causing the death, is reported by Dr. Bauer. In this particular case, the woman, who was suffering from arthritis, had been administering the vitamin to herself without a doctor's prescription, and had taken at least 100,000 to 500,000 units per day for a year.

The lay person who gives vitamin D to himself, Dr. Bauer said, is usually ignorant of toxic symptoms. When taken in excess of tolerance this vitamin produces characteristic symptoms consisting of loss of appetite, nausea, vomiting, diarrhea, muscular weakness and soreness, fatigue, frequency of urination and headaches. If these symptoms occur, administration should be stopped or the dose reduced.

The intoxicating dose depends upon several factors and varies in different individuals and at different times, Dr. Bauer said.

In the case reported, the total amount of vitamin D consumed appears to be larger than in previously reported children's cases with fatal intoxication. If, however, the dose is calculated in units per kilogram of body weight, it is seen that the dose was rather small and was far below the amount usually considered the toxic level for humans.

Concentrated vitamin D preparations, Dr. Bauer concluded, should be considered as potentially toxic drugs and should be taken only on the advice and under the supervision of a physician.

Science News Letter, October 20, 1945

ANTHROPOLOGY

Skull from Africa Is More Man-Like Than Supposed

➤ A NEW restoration of the skull of an ancient animal intermediate in physical characteristics between a man and an ape shows it to have been less ape-like, more man-like, than preliminary studies indicated. The creature, called *Plesianthropus* (Greek for "almost man"), represented thus far by skull fragments, brain cast and a few teeth, was discovered near Johannesburg, South Africa, by Dr. Robert Broom, well-known anthropologist who has done much work on the fossil primate remains of that region.

The present restoration, made by Dr. William K. Gregory and Dr. Milo Hellman of the American Museum of Natural History, is not intended to be the final one: too many parts are still missing. But so far as it has been made, on the basis of casts and minutely detailed measurements sent to this country by Dr. Broom, it takes an intermediate position between apes and men.

Details regarding the new restoration are published in the *Journal of Physical Anthropology*, (Sept.)

Science News Letter, October 20, 1945

IN SCIEN

PHARMACOLOGY

Ergot Successfully Grown Under Tropical Conditions

➤ ERGOT, a fungus drug widely used in obstetrical medicine, has been successfully propagated artificially under tropical conditions in the province of Bengal, India, J. C. Saha and S. K. Bhattacharjee of Presidency College state in a report sent to the English scientific journal, *Nature*, (Sept. 22.) Present world supplies of this drug come principally from wild sources in Spain and Portugal. If the experiments in India can be followed up by successful commercial-scale production, India may eventually have ergot for export after supplying home needs.

Ergot is made from a parasitic fungus that invades the tissues of plants belonging to the grass family, forming long, dark masses of fruiting bodies in place of part of the grains in the normal head. These fruiting masses, dissolved and purified, are the source of commercial ergot.

In the experimental propagation, four small plots of ground were planted in rye. When the grain was in flower, a suspension of ergot spores in sterile water was sprayed over them. Shortly thereafter signs of infection appeared on the plants, and in due time large grains of high-quality ergot were produced.

Ergot cultivation has been tried out on an experimental basis in England, Wales and Australia, but the present tests are believed to be the first to be attempted in a tropical country.

Science News Letter, October 20, 1945

AERONAUTICS

Propellers Enable Plane To Land on Short Runway

See Front Cover

➤ THE REVERSIBLE PITCH propellers of the B-32 Bomber, shown on the front cover of this SCIENCE NEWS LETTER, enable the plane to land on a shorter runway and increase its maneuverability during ground operations. They are the largest-diameter propellers installed on any production airplane.

A complete story on the B-32 appeared in the August 4 issue of SCIENCE NEWS LETTER, just after the details of its construction were released.

Science News Letter, October 20, 1945

E FIELDS

CHEMISTRY

Surplus Cotton to Make Stronger Currency Paper

➤ SURPLUS COTTON, one of the biggest of American economic headaches for the past couple of decades, is booked to strengthen the country's finances in a new and most literal way. Officials of the Department of Agriculture state that surplus stocks of short-staple cotton, up to 50,000,000 pounds, will be diverted for use in the direct manufacture of paper for use in dollar (and larger) bills, in Victory bonds, insurance policies, etc.

Paper containing cotton fibers is especially tough and long-lived, and is considered especially desirable for uses involving a lot of handling and folding, as well as preservation for long periods.

Because of the present government-supported high price of cotton, incentive payments to paper mills using this surplus are planned, to offset the difference between cotton price and the lower prices of rags and clippings commonly used for like purposes.

Science News Letter, October 20, 1945

BIOCHEMISTRY

New Antibiotic Comes From Wound Bacteria

➤ A NEW ANTIBIOTIC, or germ-checking substance of the penicillin type, has been discovered by a group of three researchers at the College of Physicians and Surgeons, Columbia University, Balbina A. Johnson, Herbert Anker and Dr. Frank L. Meleney. (*Science,* Oct. 12.)

It was first observed that certain rod-shaped bacteria isolated from wound infections exerted an inhibiting effect on other bacteria grown in the same laboratory dishes. A pure culture of these bacteria in broth was made, the living cells filtered out, and the clear fluid tested against other bacteria. When a number of these failed to grow in the presence of the fluid, it seemed evident that an antibiotic substance was present, and work was begun toward its concentration and isolation.

The discoverers have given their new antibiotic the name bacitracin. It is effective under laboratory conditions against a number of trouble-making bacteria belonging to the so-called gram-negative group, especially members of pus-forming, blood-poisoning streptococci and staphylococci, and also the germs of gonorrhea. Tried out on living animals, it has proved able to protect guinea pigs against gas gangrene and mice against one type of blood poisoning.

Tests on human beings have been made with extreme caution so far, but in cases where it has been injected under the skin of human volunteers it has caused no harm, and it has "given encouraging results" against local hemolytic streptococcal and staphylococcal infections. The results have been comparable to those obtained in the same class of cases with penicillin.

Science News Letter, October 20, 1945

AERONAUTICS

Planes Outlined For Sonic Speeds

➤ THE SILHOUETTE of the plane of the future is foreshadowed in the carefully formulated curves on which patent 2,385,845 was granted to George S. Schairer of Seattle. These outlines are intended to meet conditions imposed by speeds on the order of the velocity of sound. Most notable thing about them, to the layman's eye, is the lack of camber in the wing cross-section; all surfaces, lower as well as upper, tend to be convex. Patent rights are assigned to the Boeing Aircraft Company.

Science News Letter, October 20, 1945

ICHTHOLOGY

Carp Sent from U. S. To Stock Trinidad Waters

➤ A SHIPMENT of 800 fingerling carp has been sent by the U. S. Fish and Wildlife Service, to stock lakes and streams in the neighborhood of the American air base on Trinidad, off the northern coast of South America. The carp is an exceedingly adaptable and prolific fish, and even a small planting like this has a good chance of becoming established.

Introduced from Europe, the carp has never found much favor in this country. It is close to the bottom of the American market in order of preference as a food fish, and sportsmen generally consider it a pest. One virtue is grudgingly conceded to it: carp will survive in waters too polluted for any other species. Yet many peoples elsewhere in the world are very fond of it, and it has a long and honorable table history. Roman patricians used to have private carp ponds at their country villas, so that the fresh-caught fish could be carried directly to the kitchen.

Science News Letter, October 20, 1945

ENGINEERING

Smoke from Locomotives Abated by Steam-Air Jet

➤ LITTLE SMOKE will belch from coal-burning locomotives if they are equipped with steam-air jets properly designed and applied with adequate mufflers, it has been found by recent studies and field tests. The effectiveness of the steam jet in abating smoke has been known for years, but because of poor design of equipment has given unsatisfactory results in the past.

A report on the studies and tests was given during the recent meeting of the Cincinnati section of the American Society of Mechanical Engineers by R. B. Engdahl of Battelle Memorial Institute, Columbus, and E. D. Benton, fuel engineer of the Louisville and Nashville Railroad Company. These two men have worked on the smoke-abatement problem for two years, one in the laboratory and the other in the field, and have experimented with about 350 engines.

As a result of investigations by Mr. Engdahl, made in 1943, the values of some heretofore uncertain design features were discovered. These include steam-air entrainment ratios when steam pressure, nozzle and air tube diameters were varied over a range of practical values. Two years ago the two men undertook to develop for the locomotive a practical muffler and a method of control which would be automatic and also vary the quantities of overfire air in relationship to the amount of coal burned.

"In no sense of the word," the investigators stated, "should it be assumed that the steam-air jet is a complete substitute for a good fireman. Neither working independently of the other is able to do a satisfactory job at all times. When they complement each other they are an unbeatable team, even under adverse conditions."

Science News Letter, October 20, 1945

ENGINEERING

John Fritz Medal Awarded Dr. Zay Jeffries

➤ LEADERSHIP in solving problems affecting the production, conservation, substitution and scientific appraisal of metals and alloys during the war has won for Dr. Zay Jeffries, vice president of the General Electric Company, the 1946 award of the John Fritz Medal. Classed as the highest award in engineering, this medal is bestowed by four leading engineering societies.

Science News Letter, October 20, 1945

PHYSICS

Control of Atomic Power

Scientists who have been engaged in research on the bomb at Oak Ridge, Tenn., urge that finding a way for international control is the only solution.

This is the full text of a statement on the future of atomic energy prepared by a group of scientists engaged in research on the bomb at Oak Ridge, Tenn., laboratory. It is an analysis of the problem that is now being considered by Congress and the world.

➤ THE DEVELOPMENT and use of the atomic bomb has introduced an important new element into world politics and has created a situation fraught with grave danger for our nation and the world. Many of the scientists who have been working on atomic bombs as a necessary military measure in time of national peril did so with misgivings concerning the ultimate repercussions of such a discovery. Consequently, they have been thinking about this situation for a considerably longer time than was possible for the public. We feel that it is our duty to present to the public the basic facts concerning the atomic bomb and their implications for United States foreign policy. Only by a full realization of these facts can the citizens of this country intelligently participate in making decisions that the unleashing of atomic energy compels us to make. If wrong decisions are made, it may mean the destruction of our cities, horrible death for millions of our people, and possibly the end of our nation.

We propose to discuss this problem by analyzing possible courses of action for our government.

No Change in Present International Relations

Alternative I

Many Americans believe, either after serious consideration or because of inadequate information, that no special change in our national policy is necessary. Arguments supporting this view are that the atomic bomb does not change the basic causes of international friction and war, that it is not a development of sufficient magnitude to change the nature of warfare, that an effective defense is sure to be found, and that moral pressure and the fear of retaliation will prevent the use of atomic bombs or prevent war altogether.

Importance of the Atomic Bomb

The primary feature of the atomic bomb is its tremendous destructive power. The newspaper accounts of the destruction of Hiroshima and Nagasaki are adequate for an appraisal of the present destructiveness. By using more bombs, larger bombs and more efficient bombs it will be possible in the near future to completely destroy the bulk of the population, industry and military strength of any nation within a few weeks. Moreover, aviation and rocket developments might enable this to be accomplished within a few hours, without possibility of effective retaliation. Alternately, strategic locations may be mined in advance by agents of foreign nations. A factor of such extreme destructiveness cannot be neglected in formulating our foreign policy. By constituting a serious threat to the safety of every nation, it intensifies the causes of friction and of war.

Possibility of Specific Defense

In spite of the adage, "to each offensive weapon there has been found a defense," we as scientists can offer no hope of a specific defense against the atomic bomb. The only immediate defensive measures are retaliation, counter-offensive or "preventive" warfare, but these will not restore the ruins of our cities or revive the millions of our dead. Dispersal of population and industry over wide areas or underground can reduce the efficiency of atomic bomb raids, but cannot be considered an adequate permanent defense.

Moral Sanctions

Moral considerations did not prevent the use of atomic bombs against Japan, but it might be argued that the population at large was not consulted in this decision. It is evident, however, that the Allied peoples have, to a large extent, approved the decision subsequently. In time of war, moral sanctions have never prevented the use of any weapon, no matter how terrible. Moreover, those having control over the use of atomic bombs may not be subject to moral pressure of the world in general.

Fear of Retaliation

In the past, fear of retaliation has never been a deterrent to aggressors who thought they had a chance to win. Fear of being subjected to atomic bomb attacks may, in fact, enhance the possibility that a nation will itself use them as a preventive measure.

As a result of these considerations it is evident that the world situation is definitely and considerably altered by the introduction of the atomic bomb, and that this factor must be given major consideration in our foreign policy.

United States Supremacy In Atomic Warfare

Alternative II

Many people feel that the security of the United States can best be preserved by maintaining supremacy in atomic warfare. They propose that we keep the secret of making atomic bombs, that we seek to corner the strategic materials, that we produce more numerous and more deadly bombs, and disperse our population and industries.

Keep It Secret

Those who advocate that the secret of the atomic bomb be kept mislead our people rather than other countries. *There are no longer any fundamental secrets about the atomic bomb.* The government has made public the broad outline of the discovery and methods which led to success. The remaining "secrets" are scientific and engineering details. It would be foolish to suppose that scientists and engineers in other countries would not be able to redevelop at least one of the methods we have used or develop new methods. It took the Anglo-Americans three years to achieve the transformation from the laboratory to the plant scale. Working with the knowledge that this *transformation has actually been achieved,* even those nations with lesser resources than those of the United States will be able to produce atomic bombs within two to five years.

A very dangerous consequence of a policy of secrecy is that while spurring other nations to develop atomic bombs, by withholding detailed information from the majority of our own scientists we will artificially channel and sterilize the further development of nuclear physics and chemistry in our own country.

U. S. Control of Raw Materials

It has been suggested that a way to monopolize atomic bombs is for the Anglo-Americans to control the raw materials necessary for their fabrication. The world-wide distribution of uranium ores does not permit us to achieve this control unilaterally, except by conquest. Before the war there were known uranium deposits in Canada, Belgium, Czechoslovakia, and Russia. Other deposits have undoubtedly been discovered since. It would be foolhardy to rely on the assumption that we, alone or together with Britain, can deprive the rest of the world of access to enough uranium for the production of atomic explosives.

Bigger and Better Bombs

If we cannot hope to *monopolize* atomic power, cannot we make our future secure by producing more and better bombs than the rest of the world?

Producing more and better bombs may be necessary for what security it does give during the next five years. However, we want to warn emphatically that more and better bombs cannot provide us with lasting security. Because of the tremendous potential destructiveness of atomic bombs, and because of the industrial and population concentration of the United States, having more and better bombs is no defense. *Once a nation possesses a certain minimum number of bombs there is no great advantage in having more.* In a few years, a nation with a small number of atomic bombs carried by rockets or planted as mines in our cities, could in a few minutes destroy most of the industrial resources of the United States and much of its population.

Furthermore, if we have more and better bombs, another nation may fear, justifiably or not, an attack by us, and deem it necessary to attack first.

Decentralization

The only known possible defense to existing atomic bombs is the dispersal of industry. By not presenting single targets of sufficient concentration, the effect of atomic bombs can then be reduced. However, there is no reason to doubt that in the future, atomic bombs of sufficient number and destructiveness can become available so that decentralization of industry will be only a partial defense. This would also be a difficult and costly program, resulting in a severe economic dislocation and disorganization. Furthermore, it is doubtful whether the United States could carry out a program of decentralizing industry and population without exercising totalitarian powers which would destroy both democracy and free enterprise.

Immediate World Conquest

Alternative III

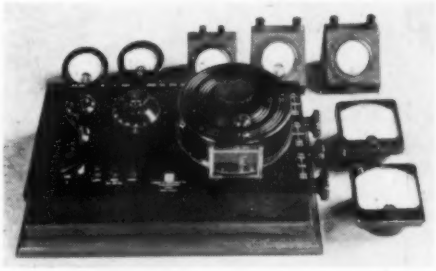
If we reveal no more information to other nations, the United States may maintain leadership for a few years. It is almost certain that after five years all of the great powers will, if not prevented by force or agreement, possess atomic bombs in such number, size and efficiency that raids can produce tremendously more destruction than that inflicted on Hiroshima and Nagasaki. Science can promise no defense against such raids. Because of the industrial concentration of the United States and the congestion of our cities, we are especially vulnerable to such attacks and it is entirely possible if we do not decentralize our industries, that most of our industrial potential could be wiped out by such raids in the first ten minutes of war.

This means that after five years the United States cannot rely for its security upon producing more numerous and more deadly atomic bombs. This knowledge has led some to propose that the United States insure its security by forcibly preventing other nations from producing atomic bombs. Since no nation would peacefully consent to our suppression of their development of atomic power, this *course of action means that we must conquer the world within the next five years,* before the other nations of the world achieve equality in atomic power. At the present stage of atomic bomb development, such world conquest would be neither quick nor certain. Clearly, such a policy is against the democratic tradition and expressed views of the American people. In fact, it is hard to see in what way such a course of action differs from that of the Nazis.

International Control Of Atomic Power

Alternative IV

International control of atomic power is another alternative that has been widely proposed. No specific plans have been prepared, and we do not intend to offer one here. We recognize that any such plan involves many difficulties, and may require that in order to preserve the peace of the world, we forego some potential peaceful applications of atomic power and some phases of our national sovereignty. The alternatives are clear. If we ignore the potentialities of atomic



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warfare, in less than a generation we may find ourselves on the receiving end of atomic raids. If we seek to achieve our own security through supremacy in atomic warfare, we will find that in ten years the whole world is as adequately armed as we, and that the threat of imminent destruction will bring about a "preventive" war. If we recognize that our present leadership in atomic power can last at the most several years, and we attempt to dominate the world, we will find ourselves immediately involved in another and greater war in violation of our democratic moral code and with no assurance of victory.

In view of the disastrous nature of these alternatives, we must expend every effort to achieve international cooperation and control as the only real and possible long-term solution.

We strongly urge the people of the United States and their leaders to think about, and find a means for, the international control of atomic power. The United States must exert its leadership to promote world peace. The people of the United States, together with the peoples of the rest of the world, must demand that their leaders work together to find the means of effective international cooperation on atomic power. They must not fail. The alternatives lead to world suicide.

Science News Letter, October 20, 1945

MEDICINE

Artery-Cutting Operation Relieves Migraine Headache

➤ AN ARTERY-cutting operation that brings relief, apparently permanently, in one type of migraine headache is reported by Dr. Samuel B. Nadler, of Tulane University School of Medicine, in the *Journal of the American Medical Association,* (Sept. 29).

The particular headache comes in periodic attacks of throbbing pain, frequently "unbearable," over the right or left temple or both. The pain may radiate over a larger part of the head. Stomach and intestinal upsets often accompany the headache. Dizziness and the visual disturbances that come in some cases of migraine were not present with the headaches, Dr. Nadler reports.

Pressing with the fingers on the temporal artery on the side of the headache abolished the throbbing pain and most of the continuous dull ache that patients also suffered. Injecting a local anesthetic into the tissue around the artery brought relief, often within one minute, which lasted from several hours to several days.

More prolonged relief, two to 11 months so far, was achieved by the operation in which the artery was cut and tied. The operation was successful in five of eight patients whom Dr. Nadler has seen with this type of headache during the past year. The other three had less frequent attacks and preferred to have the injections of local anesthetic instead of the operation.

Science News Letter, October 20, 1945

AERONAUTICS

Great Increase In Aviation Courses

➤ AMERICAN youth, long air-minded, has become increasingly so during the war, and additional millions of students of both sexes will be enrolled in high school and college aviation courses this fall.

Since last October more than $38,000,000 worth of aircraft equipment has been turned over to non-profit schools in an Army Air Force project. Additional obsolete instruments, engines and complete planes will be available to schools in the next few months, through the Education Disposal Section of Reconstruction Finance Corporation.

An estimated 96% of American colleges and universities now recognize aeronautics as an elective science, and about half accept it as a laboratory science for entrance requirements.

The Civil Air Patrol, now a part of the Army Air Forces Training Command, with a membership of 80,000 cadets and 55,000 senior members, wing commands in each state, groups, squadron and flight units in more than 1,000 cities and towns, can adequately train students for flight personnel in postwar commercial aviation.

Science News Letter, October 20, 1945

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Outwitting the weather

How science copes with Old Man Weather is illustrated by these ideas and devices from General Electric laboratories.

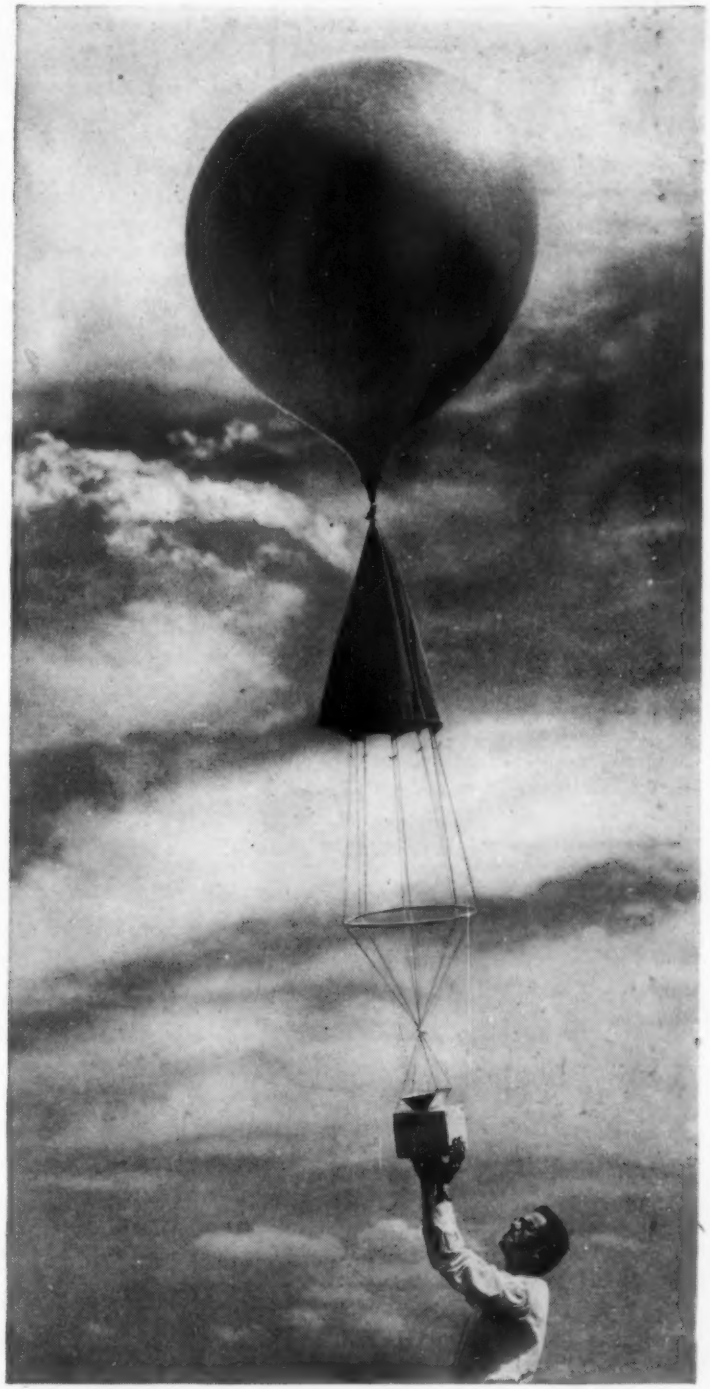
How high are the clouds? A ceilometer measures this for airmen. How wet is the weather? Hay can now be stored in barns before it is dry, with a new hay-drying system with G-E control. And one G-E laboratory makes weather—with or without rain, wind, sleet, snow—to test G-E turbo-superchargers.

On this page are a few more examples of the way General Electric research and engineering are being devoted to this phase of human comfort and health. *General Electric Company, Schenectady, N. Y.*

Cloudy but bright. When clouds darken the sky, lights come on in this schoolroom. No one has to remember; a General Electric automatic light control with an "electric eye" keeps constant watch, safeguards young eyes by turning on the lights whenever needed.

Cucumber magic. Vines in electrically heated soil (right) grew twice as tall, and bore one month earlier. A heating cable, developed by G-E engineers, is buried in the soil and thermostatically controlled. More than 15,000 commercial growers use G-E soil-heating cable.

Spring weather. Cool, mountain-top comfort in your bedroom, or anywhere else in your house, will be provided by G-E air conditioning units. Nor have G-E engineers forgotten winter problems; they have applied G-E research and engineering to home heating systems, too.



Weather detective goes aloft in the small box suspended from the balloon. Some 12 miles up the balloon bursts, and the box is parachuted back to earth. On the way up, this electronic device, called the G-E Stratometer, gives a running commentary on the weather—temperature, humidity, air pressure—and sends this information back to earth by radio signals. The information gathered by the G-E Stratometer can be used to help predict weather.

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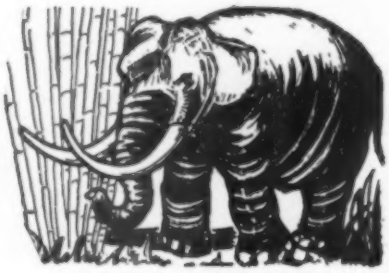
ZOOLOGY

NATURE RAMBLINGS

by Frank Thone



Postwar Perils

► GREATEST dangers brought by the war to the animals of the Old World's warmer lands will come now, after the soldiers have stopped shooting. It is not known yet how much damage was done to the wild beasts of the jungles by the conflicting armies that clashed in their tangled depths. Probably, however, the direct destruction was not very great. A number may have been killed by chance bombs and shells or by stray bursts of machine-gun fire. Occasional antelope or wild pigs may have been shot by troops for fresh meat. But the animals, knowing the forest better than the human strangers could ever hope to, were probably able to slip away from the scenes of fighting and hide until the noises stopped.

However, now that men have stopped shooting at each other, some of them will want to relax by going a-hunting. We can expect greatly increased hunting pressure on surviving wild-animal populations, now that air travel to the remotest corners of the earth has become commonplace. True, governments controlling the remaining big-game lands are much more conservation-minded than we Americans were a couple of generations ago when we massacred the bison and the pronghorn. But we can expect the animals to be hunted right up to the bag limits—and considerable effort to be exerted to extend those limits.

An even greater danger threatens. Some of the great game areas will probably be opened up to agriculture and grazing by the end of the present century. Means for making life in the tropics safer and more comfortable were being worked out even before the war, and their development was greatly hastened under the necessities of the conflict. DDT may rid great stretches of Africa of the dreaded tsetse fly, bearer of sleeping sickness to man and the equally deadly nagana to animals. And where man takes his cattle and horses in, elephant and antelope and zebra and giraffe must depart, just as deer and elk and bison departed from most of our own continent.

There is an even graver threat, of a disaster that may overwhelm not only the game animals but the very ground they and their domesticated rivals walk and graze on. So-called civilized man has made a very bad record as a destroyer of soils by over-cultivating, over-cutting and overgrazing, just to get more money. But to certain native peoples cattle are not a means to wealth, they are wealth itself: a man's standing is not reckoned in dollars but in cows. Such peoples almost always over-graze their pastures whenever they get a chance—and disaster dogs their heels. Unless new lands opened up in the tropics are administered with scientific wisdom and the firmest of discipline, neither game nor livestock will long survive to enjoy them.

Science News Letter, October 20, 1945

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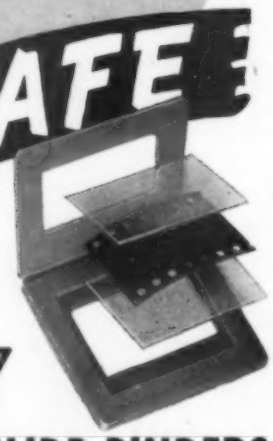

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• Books of the Week •

➤ THE GEOLOGICAL origin, climate, resources and people of Pacific islands formerly mandated to Japan are presented by William Herbert Hobbs in FORTRESS ISLANDS OF THE PACIFIC. The volume contains 83 original maps and diagrams and 24 drawings from photographs taken by the author. It is a publication of particular interest at this time because some of these islands may remain possessions of the United States. (*J. W. Edwards,* $2.50.)

Science News Letter, October 20, 1945

➤ THE DEVELOPMENT of mathematical ideas from their simple beginnings to their modern complexity in science, engineering, aeronautics and navigation are traced in an interesting readable book, THE RIVER MATHEMATICS by A. Hooper. It can be read for pleasure, or for pleasure and profit. (*Henry Holt,* $3.75.)

Science News Letter, October 20, 1945

➤ BOTH THE chemistry and the practical utilization of plastics are treated in the TECHNOLOGY OF PLASTICS AND RESINS, by Dr. J. Philip Mason and Dr. Joseph F. Manning. It is a book for those who have had introductory courses in general and organic chemistry. (*Van Nostrand,* $6.50.)

Science News Letter, October 20, 1945

➤ EXTENSIVE information for tool engineers, millwrights and factory managers is contained in MACHINE TOOL GUIDE. Its 780 pages include drawings, dimensions, specifications, and important data on machine tools, prepared with the help of 61 of the most important manufacturers. The guide was prepared by Tom C. Plumridge, Roy W. Boyd, Jr., and James McKinney, Jr. (*American Technical Society,* $7.50.)

Science News Letter, October 20, 1945

• Just Off the Press •

AMERICAN PHARMACY, 1945—Rufus A. Lyman, M.D., ed.—*Lippincott,* 540 p., illus., $8. A comprehensive work which will serve well the needs of the student and of the teacher in Schools of Pharmacy.

ELECTRIC MOTORS AND GENERATORS: Related Drives, 1945—E. S. Lincoln—*Essential Bks.,* 381 p., illus., $3. This book covers direct and alternating current motors of all kinds.

ELECTRICAL MEASURING INSTRUMENTS: Measurement and Surveys, 1945—E. S. Lincoln—*Essential Bks.,* 284 p., illus., $3. This book covers operating principles of all types of industrial electric measuring instruments.

ELECTRICAL PROTECTIVE EQUIPMENT AND POWER-FACTOR CORRECTION: Fire Protection and Fire Fighting Equipment, 1945—E. S. Lincoln—*Essential Bks.,* 242 p., illus., $3.

INDUSTRIAL ELECTRIC LAMPS AND LIGHTING, 1945—E. S. Lincoln—*Essential Bks.,* 342 p., illus., $3. This book completely covers every type of industrial lamp with detailed instructions for their use.

OBSERVATIONS AND RESULTS IN PHYSICAL OCEANOGRAPHY, 1945—Dept. of Terrestrial Magnetism—Scientific results of cruise vii of the Carnegie during 1928-1929 under the command of Capt. J. P. Ault. Oceanography—1-B—*Carnegie Institution,* publication no. 545, 315 p., paper, $3.

PLANT LIFE OF THE PACIFIC WORLD, 1945—Elmer D. Merrill—*Macmillan,* 295 p., illus., $3.50. One of the Pacific World Series, under the Auspices of The American Committee for International Wild Life Protection.

PLASTER OF PAR'S TECHNIQUE: In the Treatment of Fractures and Other Injuries, 1945—T. B. Quigley—*Macmillan,* 107 p., illus., $3.50.

THE STORY OF LINEN, 1945—William F. Leggett—*Chemical Pub.,* 103 p., $2.75. An authentic and concise history of linen compiled in one volume.

TOMORROW'S HOUSE: How to plan your Post-War Home now, 1945, George Nelson and Henry Wright, eds.—*Simon & Schuster,* 214 p., illus., $3. This book tells you also how to remodel and how to make the best use of the latest materials, equipment and appliances.

WHAT THE INFORMED CITIZEN NEEDS TO KNOW, 1945—Bruce Bliven and A. G. Mezerik—*Duell,* 377 p., $3. An informed round-table discussion of every great issue facing the United States and the world today.

Science News Letter, October 20, 1945

To Maintain the Integrity of Hepatic Activity

Protein has been termed one of the most effective dietary principles in safeguarding the integrity of hepatic function against a host of toxic agents. This ability of protein to counteract toxic influences has been demonstrated experimentally by the protection afforded the liver when certain amino acids are administered to the protein-depleted animal immediately prior to chloroform anesthesia.[1] Similar results are reported regarding the influence of arsenicals in protein-adequate and inadequate feedings.[2]

Certain amino acids, especially methionine and cystine, appear to be of prime importance for this protective influence. It may well be that the destructive action of many hepatotoxic agents is exerted through interference with some vital role of methionine in cell metabolism.[3]

Among man's protein foods meat ranks high, not only because of the percentage of protein contained, but principally because its protein is of excellent quality, presenting all the important amino acids, including methionine and cystine.

1 Miller, L. L., and Whipple, G. H.: J. Exper. Med. 76:421, 1942.
2 Messinger, W. T., and Hawkins, W. B.: Am. J. M. Sc. 199:216, 1940.
3 Himsworth, H. P., and Glynn, L. E.: Lancet 1:457, 1944.

ACCEPTED AMERICAN MEDICAL ASSN. Council on Foods and Nutrition

The Seal of Acceptance denotes that the nutritional statements made in this advertisement are acceptable to the Council on Foods and Nutrition of the American Medical Association.

AMERICAN MEAT INSTITUTE

MAIN OFFICE, CHICAGO . . . MEMBERS THROUGHOUT THE UNITED STATES

New Machines and Gadgets

⚙ *TRAILER extension, to give more floor space when camping, consists of a wide side door, hinged to the floor so that it may be opened out as a platform. Attached to it are an arched roof and end pieces which rest inside the trailer when the door is closed.*

Science News Letter, October 20, 1945

⚙ *TOY GUN, which sounds like a tommy-gun, resembles the ordinary plaything, but has arc-shaped scallops near the barrel end. An attached slidable hollow handle contains a reed with a free end that jumps from one scallop to the next, making the noise.*

Science News Letter, October 20, 1945

⚙ *HAND MAGNIFIER, with means of lighting objects under examination, is an elongated magnifying lens held in a frame with a widened base containing an electric bulb and reflector. An oblique handle, through which the electrical connection passes, is attached to the base of the frame.*

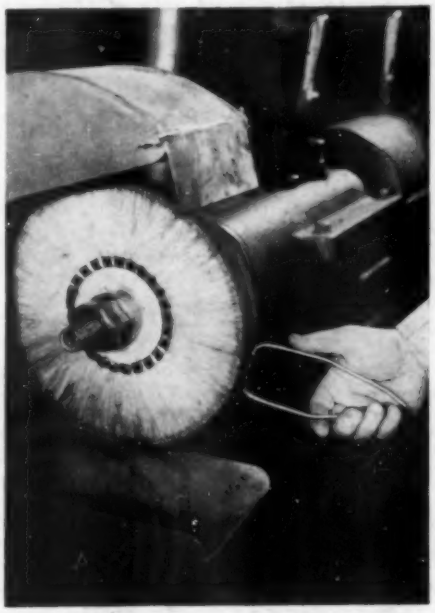
Science News Letter, October 20, 1945

⚙ *NYLON LAYER, thinner than the finest stocking, sandwiched between the layers of synthetic rubber that form the flexible walls of warplane fuel tanks, prevents fuel from escaping through the walls. It keeps in both high-octane liquid fuel and gas fumes.*

Science News Letter, October 20, 1945

⚙ *PORTABLE step, to enable automobile repair men to reach the engine more easily, hangs with two hooked supporters from the front tire of the vehicle. The suspension hooks, which reach over the tire, are kept from sliding by the tread of the tire.*

Science News Letter, October 20, 1945



⚙ *HAND-MADE forceps; for holding tiny machine parts against a brushing wheel to remove surface irregularities, were developed by a workman in a war equipment plant. The picture shows the simple device which speeds up the job and makes it easier.*

Science News Letter, October 20, 1945

⚙ *WIRE STRIPPING device, to remove insulation from electric wires, has four blades that may be moved inward toward the center wire by pressing on the spring handle. When the insulation is cut through, this covering is removed by pulling the wire out of the device while continuing to squeeze the handle.*

Science News Letter, October 20, 1945

⚙ *DUCTS made of fire-resistant glass fiber combined with synthetic rubber and resins are used in an Army cargo plane to carry hot air, heated by the engine exhausts, to all parts of the wings and the tail assembly to combat ice formation. These non-metallic ducts are light.*

Science News Letter, October 20, 1945

⚙ *CONTINUOUS flow fuel system for aircraft, developed by the Army, automatically feeds gasoline to the engine as long as there is any left in the plane tanks. It is based on a simple arrangement of fuel lines and the use of a simple float operating valve; no operation by the pilot is required.*

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If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 281.

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